



NATIONAL INTEGRATED LANDS SYSTEM

LAND SURVEY INFORMATION SYSTEM

DATABASE DESIGN DOCUMENT

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UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAND & RESOURCES PROJECT OFFICE
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Revision/Change Record

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1 Scope

1.1 Identification

| | |
|-----------------------|---|
| Project Name | National Integrated Lands System |
| System Name | Land Survey Information System |
| System Abbreviation | LSIS |
| System Version Number | 1.01 |
| Project Office | Land & Resources Project Office (L&RPO), WO330D |
| Project Manager | Leslie Cone, Project Manager of Land & Resources Project Office (L&RPO), WO330D |
| Project Sponsor | Henri Bisson, Assistant Director Renewable Resources and Planning, WO200 |
| System Users | |
| System Developer | Land & Resources Project Office (L&RPO), WO330D |
| Supporting Agencies | Non-Applicable |

1.2 System Overview

NILS

The National Integrated Land System (NILS) is a joint project between the Bureau of Land Management (BLM); USDA Forest Service (USFS); and state, county, and private organizations. NILS will provide a business solution to land managers who face an increasingly complex environment of complicated transactions, legal challenges, and deteriorating and difficult-to-access records.

As part of the NILS solution, the worlds of surveying and GIS technology will be unified through a nationwide data model, in-field computing tools, a measurement management engine to analyze survey data, and parcel creation and maintenance tools. The integration of surveying and GIS provides land managers with a complete field-to-fabric technology solution. The Survey Management and Measurement Management applications provide the foundation for a highly controlled parcel fabric.

LAND SURVEY INFORMATION SYSTEM

Land Survey Information System (LSIS) is a set of applications that provides the public with the ability to download survey data. This data comes in the form of Public Land Survey data (PLS). The downloaded data can then be imported into a variety of survey equipment and used in GIS analysis. The LSIS database is a subset of the NILS database, and alternate source data from other government agencies.

1.3 Document Overview

The Database Design Document (DBDD) describes the design and structure of the elements comprising the LSI database. A Revision/Change Record will be used to notate changes in plans, designs, or development of the DBDD. The LSIS DBDD has four major areas:

- Section 3.1: Introduction describes the database.
- Section 3.2: LSIS Database Design details all database components and structures.
- Section 3.6: Extracting Data from LSIS explains Website and Shapefile Extraction.
- Appendix A: Geographic Coordinate Database (GCDB) Files lists flatfiles available from the LSIS web site.

2 Referenced Documents

The Database Design Document references the following documents:

2.1 Government Documents

Software Requirements Specification
Software Design Document (SDD)
Initial NILS System Architecture Design

NILS-XXX-SRS-V1.00.00-000-00000000
NILS-XXX-SDD-V1.00.00-000-00000000
December 2001

2.2 Non-Government Documents

Building a Geodatabase
Modeling Our World: The ESRI Guide to
Geodatabase Design

3 Geodatabase Design Overview

3.1 Introduction

The LSIS Database was created to hold Geographic Coordinate Database (GCDB) data, and is the new standard for GCDB Geographic Information System (GIS) data. The database was created by technical users representing the BLM Cadastral Program, and the Federal Geographic Data Committee (FGDC). GIS specialists are encouraged to utilize the Land Survey Information System (LSIS) database and accompanying website, whenever feasible, in the creation of GIS products that are based on GCDB data. The LSIS database was created using ArcSDE (Spatial Database Engine) technology, and the LSIS website uses ArcIMS (Internet Mapping Service) technology, both ESRI products.

The LSIS database adheres to the FGDC standards, and allows for data to be extracted in an Open GIS format. The source data used to create the LSIS database are the official survey records and corresponding geodetic control information. This document describes the LSIS database structure, and the shapefiles that are extracted from it.

3.2 LSIS Database Design

The LSIS Database was created from coverages that were produced using GCDB Data Prep v. 1.04. The coverages are created from input text files containing survey information. The software validates and standardizes the input data and then creates the LSIS database with the following tables.

| Table Name | Spatial Features | ArcSDE Feature Class |
|------------|------------------------|----------------------|
| COORDMEAS | Control Points | Points |
| COORDS | GCDB Points | Points |
| FIRST | Section Areas | Polygons |
| LADESC | Land Description Areas | Polygons |
| RECBND | Survey Lines | Arcs |
| TWNSHP | Township areas | Polygons |

The data is linked using the township name that is constructed from the 2 letter state code, 2 digit principal meridian code and the tier/range codes (i.e. NM23T0320N0050W for Township 32N Range 5W of the NM Principal Meridian). Projection files are included with the extracted data to define the spatial reference system of the coordinates.

3.2.1 COORDMEAS – Control Points Layer

The COORDMEAS layer is comprised of points that contain control locations for the specified township. Control point features are described by elements such as a point identifier (PNTID), elevation (ELEV) and reliability measurements.

3.2.2 COORDS – GCDB Points Layer

The COORDS layer contains points used to build the survey lines and in turn the polygons. Attributes include Point ID (PNTID), reliability (XACC, YACC), elevation (ELEV), and the software used to collect the data (SWUSD).

3.2.3 FIRST – Section Polygon Layer

The FIRST layer contains section information including, section fraction (SECFRT) and duplicate section (SECDUP).

3.2.4 LADESC – Land Area Description Polygon Layer

The LADESC layer contains the land description area information. These features can be overlapping, and represent one survey type. Attributes include quarter section (QSECTN) and acreage (LADESCAR).

3.2.5 RECBND – Survey Lines Layer

The RECBND layer is comprised of survey lines used to construct the polygons. Attributes include line type (LNTYP).

3.2.6 TWNSHP – Township Polygon Layer

The TWNSHP layer includes polygons aggregated into a single feature representing the township boundary. Attributes include, state (STATE), principal meridian (PRIMER), tier (TOWN) and range (RANGE).

3.3 Definitions of Tables and Column Types

3.3.1 Table Headings

| Column Name | Name of the item within the table |
|--------------------|--|
| Full Name | Full name of the item |
| GCDB Name | GCDB name of the item |
| Width | Width of the item within ArcSDE |
| Type | Item type |
| Decimals | Number of decimals |
| Description | Description of the data within the item |

3.3.2 Item Types Used in LSIS Database

| | |
|----------|---|
| Blob | Smart large object data type that can store any kind of binary data |
| Date | Calendar data storage, requires 4 bytes |
| Decimal | Fixed-point decimal numbers |
| Integer | Whole numbers |
| Smallint | Whole numbers between -32,767 and 32,767 |
| Varchar | Character data |

3.4 LSIS Database Tables

3.4.1 COORDMEAS Table

| COORDMEAS Table | | | | | | | |
|-----------------|--|------------|-------|---------|----------|---|-----------|
| Column Name | Full Name | GCDB Name | Width | Type | Decimals | Description | Populated |
| CMEASID | Coordinate Value Measured ID | | 9 | integer | 0 | Internally Generated Number | N |
| PNTNM | Coordinated Location ID | | 9 | integer | 0 | Internally Generated Number | N |
| CTRLID | Control Point ID | point_id | 9 | integer | 0 | Control Point/Station ID | Y |
| LNDKEY | Land Key Index | | 16 | varchar | 0 | Compilation of State, Principal Meridian, Township and Range | Y |
| NORTH | Y Coordinate | y-coord | 14 | decimal | 9 | Latitude of Control Point in Decimal Degrees | Y |
| EAST | X Coordinate | x-coord | 14 | decimal | 9 | Longitude of Control Point in Decimal Degrees | Y |
| ELEV | Z Coordinate | elev | 9 | decimal | 3 | Elevation in Feet | Y |
| SRCID | Source ID | | 6 | integer | 0 | Internally Generated Number | Y |
| SIDQUAL | Source ID Qualifier | | 32 | varchar | 0 | Source of Data | Y |
| CAPMET | Capture Methodology | | 16 | varchar | 0 | Method in which data was captured | N |
| STATNM | Station Name Published | | 16 | varchar | 0 | Published Station Name | N |
| STATIDP | Station ID Published | | 5 | integer | 0 | Published Station ID | N |
| VALSTAT | Coordinate Value Status | | 16 | varchar | 0 | Status of Coordinates | N |
| USDFLG | Used in Technical Adjustment Flag | avail_flag | 1 | varchar | 0 | Flag indicating that this control point is available, but was not actually use for control purposes | Y |
| USCFLG | Used in Cartographically - Aligned Adjustment Flag | | 1 | varchar | 0 | | N |
| OBJECTID | Internally generated ArcSDE Number | | 9 | integer | 0 | Used by ArcSDE to allow clients to view the data | Y |

3.4.2 COORDS Table

| COORDS Table | | | | | | | |
|--------------|-------------------------------------|-----------|-------|----------|----------|--|-----------|
| Column Name | Full Name | GCDB Name | Width | Type | Decimals | Description | Populated |
| CVALID | Coordinate Value ID | | 9 | integer | 0 | Internally Generated Number | N |
| LNDKEY | Land Key Index | landkey | 16 | varchar | 0 | Compilation of State, Principal Meridian, Township and Range | Y |
| PNTID | Point ID | point_id | 6 | varchar | 0 | Station/Point ID | Y |
| PNTNM | Coordinated Location ID | | 9 | integer | 0 | Internally Generated Number | N |
| ADJID | Adjustment Dataset ID | | 5 | integer | 0 | Internally Generated Number | N |
| NORTH | Y Coordinate | y-coord | 14 | decimal | 9 | Latitude in decimal degrees | Y |
| EAST | X Coordinate | x-coord | 14 | decimal | 9 | Longitude in decimal degrees | Y |
| ELEV | Z Coordinate | elev | 9 | decimal | 3 | Elevation in feet | Y |
| SWUSD | Software Used | software | 4 | varchar | 0 | Collection Software (GMM/PCCS) | Y |
| YACC | Y Accuracy | error_n | 9 | decimal | 3 | Error Ellipse North in feet | Y |
| XACC | X Accuracy | error_e | 9 | decimal | 3 | Error Ellipse East in feet | Y |
| ZACC | Z Accuracy | | 9 | decimal | 3 | | N |
| HDATUM | Horizontal Datum | h_datum | 5 | varchar | 0 | Horizontal Datum | Y |
| VDATUM | Vertical Datum | v_datum | 6 | varchar | 0 | Vertical Datum | Y |
| CRDSYS | Coordinate System | | 6 | varchar | 0 | Coordinate System | N |
| PRJUNT | Projection Unit | | 6 | varchar | 0 | Projection Units i.e. Decimal degrees | Y |
| AVGREL | Average Reliability | avg_rel | 4 | smallint | 0 | Average Reliability in feet | N |
| MAXREL | Maximum Reliability | max_rel | 4 | smallint | 0 | Maximum Reliability in feet | N |
| OBJECTID | Internally generated Arc SDE Number | | 9 | integer | 0 | Used by ArcSDE to allow clients to view the data | Y |

3.4.3 FIRST Table

| FIRST Table | | | | | | | |
|-------------|------------------------------------|-----------|-------|----------|----------|--|-----------|
| Column Name | Full Name | GCDB Name | Width | Type | Decimals | Description | Populated |
| LNDKEY | Land Key Index | landkey | 16 | varchar | 0 | Compilation of State, Principal Meridian, Township and Range | Y |
| SECTID | PLSS First Division ID | | 2 | smallint | 0 | Internally Generated Number | N |
| TOWNID | PLSS Township ID | | 9 | integer | 0 | Internally Generated Number | N |
| FRSTTP | First Division Type | | 16 | varchar | 0 | Internally Generated Number | Y |
| SECTN | Section Number | sec_no | 3 | varchar | 0 | Section number | Y |
| SECFRT | Section Fraction | sec_frac | 1 | varchar | 0 | Section fractional code | Y |
| SECDUP | Duplicate Section | sec_dup | 1 | varchar | 0 | Section duplicate code | Y |
| OBJECTID | Internally generated ArcSDE Number | | 9 | integer | 0 | Used by ArcSDE to allow clients to view the data | Y |

3.4.4 LADESC Table

| LADESC Table | | | | | | | |
|--------------|-------------------------------|------------------|-------|----------|-----------|--|-----------|
| Column Name | Full Name | GCDB Name | Width | Type | Decimal s | Description | Populated |
| LEGID | Legal Area Description ID | | 9 | integer | 0 | Internally Generated Number | N |
| GEOID | Geopolitical ID | | 2 | smallint | 0 | Internally Generated Number | N |
| LNDKEY | Land Key Index | landkey | 16 | varchar | 0 | Compilation of State, Principal Meridian, Township and Range | Y |
| LAAGNT | LAD - Source Agent | | 5 | integer | 0 | Source Agent | N |
| LAINDX | LAD - Source Index | | 5 | varchar | 0 | Source Index | N |
| LATYPE | LAD - Source Type | | 5 | varchar | 0 | Source Type | N |
| LADATE | LAD - Source Date | | 8 | date | 0 | Source Date | N |
| QSECTN | Second Division Designator | quarter | 4 | varchar | 0 | Quarter Designation (NENE, NENW) | Y |
| NOMLOC | Nominal Location | nominal_location | 1 | varchar | 0 | Nominal Location (A-P, Q-Z) | Y |
| SURORG | Survey System Origin | | 16 | varchar | 0 | Origin of Survey System | Y |
| SURSYS | Survey System Type | survey_type | 1 | varchar | 0 | Survey Type (A, B, C, D, E, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, W, X, Y, Z) | Y |
| SURNUM | Survey System Designator | survey_number | 5 | varchar | 0 | Survey Number | Y |
| SURSUF | Survey System Suffix | survey_suffix | 2 | varchar | 0 | Survey Suffix | Y |
| SURNOTE | Survey System Note | survey_note | 3 | varchar | 0 | Survey Note | Y |
| LADESCAR | Land Description Area Acreage | acreage | 9 | decimal | 2 | Acreage | Y |

| LADESC Table | | | | | | | |
|--------------|-----------------------------------|-----------------|-------|---------|-----------|---|-----------|
| Column Name | Full Name | GCDB Name | Width | Type | Decimal s | Description | Populated |
| LADUNT | Land Description Area Unit | | 16 | varchar | 0 | Units in which the area was collected | N |
| LADSRC | Land Description Area Source Code | | 1 | varchar | 0 | Organization or individual that determined the legal area description | N |
| DISCCD | Discrepancy Code | discrepancy_cd | 1 | varchar | 0 | Used when GCDB and LLD locations differ (1-5) | Y |
| EXCCD | Exception Code | exception_cd | 3 | varchar | 0 | Exception to survey type rules, numbers reference specific codes | Y |
| VALIDCD | Validation Code | validation_cd | 1 | varchar | 0 | Code to report whether GCDB and LLD land descriptions match (Y,N,V) | Y |
| DESCDUP | Duplicate Description Code | dup_desc_cd | 1 | varchar | 0 | Land Description Duplicate Code | Y |
| SUBONLY | Subsurface Only Code | subsurf_only_cd | 1 | varchar | 0 | Code indicating subsurface only survey (Y or blank) | Y |

3.4.5 RECBND Table

| RECBND Table | | | | | | | |
|--------------|------------------------------|-----------|-------|---------|----------|--|-----------|
| Column Name | Full Name | GCDB Name | Width | Type | Decimals | Description | Populated |
| LNDKEY | Land Key Index | landkey | 16 | varchar | 0 | Compilation of State, Principal Meridian, Township and Range | Y |
| RECBID | Record Boundary ID | | 9 | integer | 0 | Internally Generated Number | N |
| LINEID | Measured Line ID | | 9 | integer | 0 | Internally Generated Number | N |
| BOUNDS | Record Bounds | | 32 | varchar | 0 | Type of boundary, includes water boundaries, etc | N |
| LEGSTS | Record Boundary Legal Status | | 16 | varchar | 0 | Status of land from a legal or court perspective | N |
| CMMNT | Record Boundary Comment | | 32 | varchar | 0 | Additional information about a record boundary | N |
| LNTYP | Type of Line | type | 6 | varchar | 0 | Surveyed or computed | Y |

3.4.6 TWNSHP Table

| TWNSHP Table | | | | | | | |
|--------------|---------------------------|-----------------|-------|------|----------|--|-----------|
| Column Name | Full Name | GCDB Name | Width | Type | Decimals | Description | Populated |
| LNDKEY | Land Key Index | | 16 | 0 | varchar | Compilation of State, Principal Meridian, Township and Range | Y |
| TOWNID | PLSS Township ID | | 9 | 0 | integer | Internally Generated Number | N |
| PLSSID | PLSS Description ID | | 9 | 0 | integer | Internally Generated Number | N |
| TOWN | Township Number | tier_no | 3 | 0 | varchar | Tier Number | Y |
| TWNDIR | Township Direction | tier_dir_cd | 1 | 0 | varchar | Tier direction code (N or S) | Y |
| TWNFRT | Township Fraction | tier_frac | 1 | 0 | varchar | Tier fractional code 0 = not a fractional tier 1 = 1/4 tier 2 = 1/2 tier 3 = 3/4 tier | Y |
| RANGE | Range Number | range_no | 3 | 0 | varchar | Range Number | Y |
| RNGDIR | Range Direction | range_dir_cd | 1 | 0 | varchar | Range direction (E or W) | Y |
| RNGFRT | Range Fraction | range_frac | 1 | 0 | varchar | Range fractional code 0 = not a fractional range 1 = 1/4 range 2 = 1/2 range 3 = 3/4 range | Y |
| TWNDUP | Township Duplicate Status | township_dup_cd | 1 | 0 | varchar | Township duplicate code (Blank = not a duplicate township, A = first duplicate (second occurrence of the same township), B = second duplicate (third occurrence of the same township)) | Y |
| TWNMET | Township Metadata | twp_metadata | 5 | 0 | integer | | N |
| PRIMER | Principal Meridian Code | prinmer_cd | 2 | 0 | varchar | Principal Meridian Code | Y |
| STATE | State Code | state_cd | 2 | 0 | varchar | Two letter state abbreviation | Y |

3.5 Shapefile (DBF) Table Examples

3.5.1 COORDMEAS.DBF

| COORDMEAS.DBF | |
|---------------|------------------------------|
| Column Name | Data Example |
| cmeasid | 0 |
| pntnm | 0 |
| ctrlid | 100100 |
| lndkey | MT20T0020N0180E |
| north | 45.871046000 |
| east | -109.548240000 |
| elev | 5000.000000000 |
| srcid | 1000 |
| sidqual | BUREAU OF LAND MANAGEMENT |
| capmet | |
| statnm | |
| statidp | 0 |
| valstat | |
| usdflg | - |
| uscflg | |
| objectid | 489459 |

3.5.2 COORDS.DBF

| COORDS.DBF | |
|-------------|-----------------|
| Column Name | Data Example |
| evalid | 0 |
| lndkey | MT20T0020N0180E |
| pntnm | 0 |
| pntid | 700700 |
| adjid | 0 |
| north | 45.960066 |
| east | -109.4223 |
| elev | 5000.000000000 |
| swusd | GMM |
| yacc | 81 |
| xacc | 81 |
| zacc | 0 |
| hdatum | NAD27 |
| vdatum | |
| crdsys | GEOG |
| prjunt | DD |
| avgrel | 0 |
| maxrel | 0 |
| objecid | 10295567 |

3.5.3 FIRST.DBF

| FIRST.DBF | |
|--------------------|---------------------|
| Column Name | Data Example |
| sectid | 0 |
| lndkey | MT20T0020N0180E |
| townid | 0 |
| frsttp | section |
| sectn | 2 |
| secfrt | |
| secdup | |
| objectid | 554138 |

3.5.4 LADESC.DBF

| LADESC.DBF | |
|--------------------|---------------------|
| Column Name | Data Example |
| legid | 0 |
| geoid | 0 |
| lndkey | MT20T0020N0180E |
| laagnt | 0 |
| laindex | |
| latype | |
| ladate | |
| qsectn | NENE |
| nomloc | A |
| surorg | |
| sursys | L |
| surnum | 1 |
| sursuf | |
| surnote | |
| ladescar | 29.62 |
| ladunt | |
| ladsrc | 0 |
| disccd | |
| exccd | |
| validcd | |
| descdup | |
| subonly | |
| objectid | 8808355 |

3.5.5 RECBND.DBF

| RECBND.DBF | |
|--------------------|---------------------|
| Column Name | Data Example |
| recbid | 0 |
| lineid | 0 |
| lndkey | MT20T0020N0180E |
| bounds | |
| legsts | |
| cmmnt | |
| lntyp | 0 |
| objectid | 18823930 |

3.5.6 TWNSHHP.DBF

| TWNSHHP.DBF | |
|--------------------|---------------------|
| Column Name | Data Example |
| townid | 0 |
| plssid | 0 |
| lndkey | MT20T0020N0180E |
| town | 2 |
| twndir | N |
| twnfrt | 0 |
| range | 18 |
| rngdir | E |
| rngfrt | 0 |
| twndup | |
| twnmet | 0 |
| primer | 20 |
| state | MT |
| objectid | 16775 |

3.6 Extracting Data from LSIS

The Land Survey Information System database is an enterprise GIS solution. It holds all of the spatial and attribute data in an Informix database and uses ESRI's ArcSDE to allow users to access the data spatially. Data can be extracted from LSIS using the LSIS website. There are two formats in which users can extract data, shapefile or spatial format, and flatfile or text file format.

If a user chooses to extract data in the shapefile format, a zip file is delivered to the user. Using the ArcSDE/ArcIMS interface allows the data to be extracted into one set of shapefiles, no matter how many townships are extracted. This improvement provides a better means of delivery, and less post-processing time for users.

Each zip file includes the following information:

- COORDMEAS*, COORDS, FIRST, LADESC, RECBND, TWNSHP shapefiles
- Projection file for each of the above shapefiles
- Metadata in XML format for each of the above shapefiles

*Not all townships have COORDMEAS data.

If a user chooses to extract data in flatfile format, a zip file is delivered to the user that contains the original text files used to create the data. Appendix A has a complete list of the text files that are available for extraction. The zip file is organized by township in such a way that when extracted, all the flatfiles for a specific township will be stored in a directory named for the township.

APPENDIX A: Geographic Coordinate Data Base (GCDB) Files Available From the Land Survey Information System (LSIS) Web Site

GMM FILES

| GMM Filename | Description |
|---------------------|---|
| Township.AN | Contains label points with legal description labels and coordinate locations. |
| Township.ADD | Contains information regarding special handling of certain coordinate geometry calculations. |
| Township.ADJ | Contains information regarding the overall data set including the datum, coordinate units, projection, average elevation, number of relevant measurements input and generated, and a multiplier needed to derive a 95% positional confidence of final coordinate error values. This file includes Point IDs and adjusted coordinates. |
| Township.AVL | Contains Point IDs, Latitude(decimal seconds), Longitude (decimal seconds), default Elevation (feet), Error Estimate North (feet), and Error Estimate East (feet) for all known, published, and digitized horizontal control stations in a given project. |
| Township.CON | Contains Point IDs, Latitude (decimal seconds), Longitude (decimal seconds), default Elevation (in feet), and Error Estimate North (feet), and Error Estimate East (feet), and Datum for all control stations used in the adjustment of final coordinate values. Township.CON is derived from the township.AVL file. |
| Township.COR | Contains Point IDs, state plane coordinates and error ellipses for all points in a given project. |
| Township.DEF | Contains information related to metadata including State Designator, Principal Meridian, Project Name, State Plane Zone, Universal Transverse Mercator (UTM) Zone, Default Elevation, Linear Units, and Datum. File is used to export GCDB data into CAD software. PCCS township.DEF files are created using GCDB Data Prep software. |
| Township.IID | Contains Point ID strings that define each parcel and other coding required to reestablish the attribution (labels) of a project once the project is readjusted. |
| Township.INT | Contains lists of Point ID sets that identify intersection calculations for any intersection produced during automatic or manual subdivision. |
| Township.IRR | Contains lists of Point ID sets that define irregular subdivision calculations for the project. |
| Township.LEV | Contains Point IDs and associated elevations for all points in a data set. |

| GMM Filename | Description |
|---------------|--|
| Township.LOT | Contains information about non-aliquot land units recorded in the Legal Land Description (LLD) file. Also contains information related to the locations of elongated Government Lots. |
| Township.LSA | Contains listing of all points within a given project that were entered into the township.RAW file and were adjusted using a least squares analysis. |
| Township.LX | Contains Point IDs, Latitude (decimal seconds), Longitude (decimal seconds), Northing Error In Feet, Easting Error in Feet, Station/Project Elevation (feet), UTM coordinates, and connectivity codes for constructing a spatial representation of the GCDB data set. |
| Township.LXN | Contains a listing of Point ID strings that reflect the connectivity of points within a given project. |
| xTownship.NOT | Contains listing of unwanted points described by Point ID and unwanted lines described by From Point ID and To Point ID that should not be viewed with the rest of the GCDB data set. |
| Township.PGC | Contains Point IDs, Latitude (decimal seconds), Longitude (decimal seconds), Error Estimate North (feet), Error Estimate East (feet), and default Elevation (feet) of all points within a given project. |
| Township.RAW | Contains record Direction/Bearing (degrees, minutes, seconds) and Distance (chains) values between adjacent Public Land Survey System (PLSS) corners. The measurements are abstracted from official survey plats and/or field notes. The file contains a Source ID for each record to identify source documents. |
| Township.SID | Contains Source IDs and associated information about the source documents including Source Agency, Surveyor, Acceptance or Document Date and error estimates assigned to the survey records. |
| Township.SD | Contains error estimates of all measurements derived from the township.CON and township.SID files. These estimates determine the weighting utilized during the least square adjustment process. |
| Township.UTM | Contains Point IDs, Universal Transverse Mercator (UTM) coordinates, Northing Error (feet), Easting Error (feet), and default Elevation (feet) for a given project. |

PCCS FILES

| PCCS Filename | Description |
|----------------------|---|
| cavltownship | Contains Point IDs, Latitude (decimal seconds), Longitude (decimal seconds), default Elevation (feet), Error Estimate East (feet) and Error Estimate North (feet) for all known, published, and digitized control stations in township. |
| ctownship | Contains Point IDs, Latitude (decimal seconds), Longitude (decimal seconds), default Elevation (feet), Error Estimate East (feet), Error Estimate North (feet) and Datum for all control stations used in the adjustment of final coordinate values. This file is derived from the cavltownship file. |
| lxtownship | Contains Point IDs, Latitude (decimal seconds), Longitude (decimal seconds), Average Reliability (feet), Maximum Reliability (feet), Elevation (feet), UTM coordinates, and connectivity codes for constructing a spatial representation of the GCDB data set. |
| lqtownship | Contains label points with legal description labels and coordinate locations. |
| qtownship | Contains information related to metadata including Coordinate System, Linear Units, Datum, and Fractional Code for Tier and/or Range. |
| rtownship | Contains record Direction/Bearing (degrees, minutes, seconds) and Distance (Chains) between adjacent Public Land Survey System (PLSS) corners. The measurements are abstracted from official survey plats and/or field notes. The file contains a Source ID for each record to identify source documents. |
| ztownship | Contains information related to metadata including Coordinate System, Linear Units, Datum, and Fractional Code for Tier and/or Range. |